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Evaluation of Written Versus Mental "Worry-Time" to Treat Worry

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ABSTRACT - This study randomly assigned self-professed worriers ($N = 74$) to a four-group within and between subjects repeated measures design utilizing the Penn State Worry Questionnaire, the Worry Domains Questionnaire, and the Symptom Checklist-90 as dependent variables. Assessments were administered prior to the intervention, immediately after intervention, and at 2-weeks follow-up. Participants in the Written Worry Time group were instructed to write their worries for 15 min per day for 14 days, those in the Written Schedule group were instructed to write their schedule, those in the Mental Worry Time group were instructed to similarly think their worries, and the Control group served as an assessment only control. Counter to the hypotheses, all groups showed slight decreases in worry.

Keywords:

Worry, Worry Interventions, Penn State Worry Questionnaire, Worry Domains Questionnaire, Symptom Checklist-90

Introduction

Worry is a frequent symptom in two of the most prevalent psychological disorders, depression and generalized anxiety disorder (GAD; APA, 1994) and it is common among medical patients (Stoudemire, 1996). Despite ample research studying the nature and functions of worrying, little progress has been made in the area of worry as a target of clinical intervention (Butler, 1994). Worry is defined as a "chain of thoughts and images, negatively affect-laden and relatively uncontrollable" (Borkovec, Robinson, Pruzinsky, & DePree, 1983, p. 10). Although worry can serve adaptive functions such as problem solving or anticipatory coping, recurrent worriers find it intrusive, distressing, and uncontrollable (Borkovec, 1994).

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Worry about menial threats is believed to serve as an avoidance function of more serious and disturbing topics. By allowing an individual relief from focusing on more distressing issues and the physical arousal that generally accompanies anxiety, worry may be maintained through the process of negative reinforcement (Borkovec, 1994). Treatment for anxiety disorders, which are often maintained by avoidance, generally include exposure to the feared stimulus or in this case- actual worries. In support of this notion of worry as both an anxious mental stimulus and response, Borkovec et al. (1983) found that one time exposure to worry for 15 min, but not 0 min or 30 min, increased the reported "frequency of distracting negative thoughts" (p. 15). The purpose of the present study was to evaluate the use of mental versus written "worry time" for treating pathological worry.

The seminal work of Pennebaker and Beall (1986) showed that writing for as little as 10 min per day for 3-5 days about traumatic experiences led to beneficial health effects. Moreover, Smyth's (1988) meta-analysis of extant literature found disclosure writing significantly improved health in participants compared to controls on reported physical health, physiological functioning, and general functioning. Short-term writing increased distress, whereas writing over a longer term decreased distress. He also found that writing duration (15 - 30 min) did not differentially alter the effects. Since Borkovec et al. (1983) found a one-time 15 min writing session incubated worries, repetitive writing about one's worries for 15 min may initially invoke the worries, but allow for habituation and cognitive processing across time. This interpretation is consistent with Sloan and Marx's (2004) examination of the underlying mechanisms responsible for the positive outcome of disclosure writing. They found that higher levels of salivary cortisol, as a physiological correlate of emotional reaction, among individuals subsequent to the first writing session in a disclosure writing condition, predicted reduced depressive and PTSD symptoms. Consistent with a behavioral exposure model, this suggests that initial exposure creates an emotional/physiological reaction that then decreases across time.

Previous research targeting self-professed undergraduate worriers has produced unclear results. Haley (1997) found no effect for writing about worries using the Penn State Worry Questionnaire (PSWQ; Brown, Antony, & Barlow, 1992). Cogar, Martz, and Curtin (2001), however, found that both participants writing about worries for 20 min per day for four days as well as control participants improved on the PSWQ. Borkovec, Wilkinson, Folensbee and Lerman (1983) authored the only study to find an improvement of writing about worries (30 min per day across 4 weeks) beyond a control group, but they did not use a standardized measure of worry.

Popular media such as *Health* magazine (October, 2004) has promoted a connection between repetitive written worry disclosure and therapeutic benefit. In his self-help book, James Pennebaker (2004, p.9) describes Klein and Boals' (2001) finding that repetitive written disclosure frees working memory. He goes on to explain that "If we are worrying about things-including emotional upheavals in the past, we have less working memory," therefore suggesting that such writing is effective for treatment of worry. However, this has not been demonstrated empirically.

The purpose of the present study was to assess the effectiveness of a brief (i.e., 15 min or minimal effect found by Smyth, 1998) written versus mental worry time intervention targeting pathological worry across time. This research improves upon previous research by: 1) recruiting self-professed worriers from a community population within a clinical range for GAD based on PSWQ scores, 2) including an assessment-only control and a writing control, and 3) evaluating the immediate effects versus delayed effects of writing about worries. It was predicted that participants in the written and mental worry time groups would have significantly greater decreases in worry and related symptoms compared to those in the control groups over time.

Method

Participants

Self-professed worriers ($N = 74$) were recruited from this semi-rural community via newspaper advertisements and posters in physicians' offices. Of the original 74 recruited participants, $n = 23$ of them failed to complete the study leaving the final $n = 51$ distributed across four conditions. These completers were 100% Caucasian, of a mean age of 37.2 years ($SD = 15.8$), including 46 females and 5 males. The mean PSWQ score for the final sample was 62.1 ($SD = 7.63$) placing them above the GAD cut-off score of 52.3 (Brown et al., 1992).

Materials

Self-Created Demographic Questionnaire. Participants provided their age, gender, prescription medications, and number of psychotherapy/counseling sessions attended between study appointments (if applicable).

Self-Created Manipulation Check Questionnaire. Participants in 3 of the 4 conditions were given a notebook with instructions, per their condition, to record daily ratings of their experience with the intervention. These notebooks were returned at the end of the study and used to record their compliance with the intervention as well as daily ratings of several qualities of the intervention (e.g. "to what degree did you reveal your emotions today").

Penn State Worry Questionnaire. The PSWQ is a 16-item unidimensional questionnaire that asks participants to rate multiple qualities of worry on a 5-point scale (1 = not at all typical to 5 = very typical). The PSWQ has five reverse-scored items and can range from 16–80 (Brown et al., 1992; Meyer, et al., 1990). The PSWQ evaluates the typical tendency, excessiveness or intensity of worry, and the tendency to worry about multiple areas (Molina & Borkovec, 1994). The PSWQ has adequate internal consistency ($\alpha = .93$; Meyer et al., 1990) with an $\alpha = .81$ at Pretest in this study. The clinical threshold for diagnosis of GAD is 52.3 (DuPuy, Beaudoin, Rheame, Ladoucuer, & Dugas, 2001) when Jacobson and Truax's (1991) cut score technique is applied to data from Brown et al. (1992). The PSWQ has distinguished GAD from other anxiety disorders including obsessive-compulsive disorder (Brown et al., 1992).

Worry Domains Questionnaire. The WDQ is a 25-item scale that asks participants to indicate their likelihood to worry about several different content areas. Respondents rate each item on a 1 "Not at all" to 5 "Extremely" point Likert-scale with total scores ranging between 25 and 125 (Tallis, Eysenck, & Mathews, 1992). The WDQ has distinguished between high and low worriers because it indicates frequency of worry across specified content areas. The WDQ has acceptable levels of internal consistency ($\alpha = .92$; Tallis et al., 1992) and achieved $\alpha = .93$ in the present study on Pretest scores.

Symptom Checklist-90-R. The Symptom Checklist-90-R (SCL-90; Derogatis, 1994) is a 90-item self-report measure of current, point-in-time, psychological symptom status. Each item is rated on a 5-point Likert-scale of distress, ranging from 0 "Not at All," to 4 "Extremely." This instrument assesses nine primary symptom dimensions. Derogatis, Rickels, and Rock (as cited in Derogatis, 1994) found that internal consistency coefficients for the nine symptom dimensions, ranged from a low of $\alpha = .77$ for Psychoticism to a high of $\alpha = .90$ for Depression, and test-retest coefficients were between $r = .80$ and $r = .90$. The general symptom index (GSI) is computed by dividing the summed scores of the symptom dimensions by the total number of responses. The GSI was used as a measure of general psychopathology in this study and it achieved $\alpha = .96$.

Design and Procedure

This study used a 4-group mixed model repeated measures design. Participants were randomly assigned into one of four conditions sequentially based on the order of their call in date and time. Participants assigned to Group I (Written Worry Time; $n = 16$) were instructed to write their worries, including facts,

thoughts, and emotions during a 15-minute time period each day for 14 consecutive days. The consent form stated "We know that writing about one's worries helps to clarify the problems in our lives and motivates us to solve problems. It also helps to express our emotions and 'get them off our chest.'" Participants, identified by code number, emailed this writing to us daily.

Participants in Group 2 (Written Schedule; $n = 13$) were informed on their consent form that "We know that writing about our schedule helps us become more efficient with our time and therefore decreases daily worry." They were instructed to set aside time to write out their daily schedule and email it to us. This condition served as a control for writing about worries by writing about something more trivial. Participants assigned to Group 3 (Mental Worry Time; $n = 12$) were instructed to schedule a 15-minute time slot each day to specifically think about and process their worries. They were informed in their consent form that "Having a set time of day to worry will help free your mind from worry at other times of the day." They were not instructed to write these worries. They were, however, instructed to send the "themes/content" of these worries daily to us via email. This condition was intended to be a form of stimulus control without writing. Participants in Group 4 (Control; $n = 10$) completed the assessments at Pretest, Posttest, and Follow-up, but did not receive any instructions or homework to control their worrying. The rationale for participation in the control group, as described on the consent form, was that "awareness of one's worries (by completing the assessments) helps some people reduce the frequency of worry, especially if this awareness is fostered over time."

During the initial individual session, all participants completed informed consent, the PSWQ, WDQ, and SCL-90, and then were given instructions for their study condition. Two weeks later, all participants repeated the assessments and were told, if applicable, to discontinue their respective worry control techniques. Two weeks after this, participants repeated the assessments, were provided with more information about the study, thanked, and presented with an incentive reimbursement (\$20). All participants in Groups 1-3 returned their completed notebooks at Follow-up.

Results

Participant attrition did not differ by condition, $\chi^2 (1, N = 74) = 0.73, p = .866$. However, participants who dropped out after the initial session (pretest and homework assigned), compared to those who completed the entire study, had higher WDQ scores, $F (1, 72) = 7.7, p = .007$, but no differences on the PSWQ, $F (1, 72) = 0.001, p = .979$ or the SCL-90's GSI score, $F (1, 72) = 0.025, p = .876$. MANOVA did not reveal pretest differences on the PSWQ, WDQ, or SCL-90's GSI on the $n = 51$ completers by condition, *Wilks Lambda* $F (3,45) = 0.01, p = .55, \eta^2 = .05$ lending validity to the random assignment procedure.

Eighty-two percent of the participants reported zero psychotherapy sessions, 6% reported one session, and 12% reported two sessions during the 4-week study. Sixty-seven percent of participants reported taking no psychotropic medications and 33% reported taking one or more psychotropic medications (i.e., mostly SSRIs & benzodiazepines). There were no differences between groups on use of medications, $\chi^2 (1, N = 51) = 1.1, p = .787$, or on psychotherapy attendance, $\chi^2 (2, N = 51) = 8.85, p = .545$.

Groups 1-3 were asked to conduct daily homework and record this in their notebooks. Compliance with the intervention was operationalized as the percent of participants in each group who completed their daily homework, averaged across the 14 days. Using this formula, 87% of Group 1 complied with the intervention, 77% of those in Group 2 complied, and 93% of participants in Group 3 complied.

Outcome Analyses

RM-ANOVA with condition as the between subjects variable and time (Pretest, Posttest, Follow-up) as the within subjects variable was conducted for each of the dependent variables. Although it was predicted that participants in the written and mental worry time groups would have significantly greater decreases in worry and related symptoms compared to the controls over time, this was not found. There was no group

by time interaction on the SCL-90 GSI, $F(6, 92) = 0.48, p = .823, \eta^2 = .030$, but there was a significant improvement over time for all groups, $F(2, 46) = 121, p = .001, \eta^2 = .840$ (See Table 1). Similarly, there was no group by time interaction on the WDQ, $F(6, 92) = 0.78, p = .584, \eta^2 = .049$, but there was a trend for improvement over time, $F(2, 46) = 5.2, p = .010, \eta^2 = .183$. Finally, there was no group by time interaction effect on the PSWQ, *Wilks Lambda* $F(6, 92) = 2.0, p = .675, \eta^2 = .042$, and there was no effect for time, *Wilks Lambda* $F(2, 46) = 2.0, p = .144, \eta^2 = .081$.

Table 1: Means and standard deviations for the dependent variables by group across time

Dependent Variable	Group	Pretest	Post-test	Follow-up
PSWQ	1-Written Worry Time	63.3 (5.5)	60.1 (7.8)	59.1 (9.5)
	2-Written Schedule	61.4 (8.8)	59.2 (9.8)	59.1 (8.8)
	3-Mental Worry Time	61.6 (8.9)	63.5 (9.2)	62.0 (12.2)
	4-Control	61.9 (8.28)	61.2 (5.9)	58.6(6.84)
WDQ	1-Written Worry Time	65.3 (16.2)	63.0 (15.8)	62.3 (16.2)
	2-Schedule Writing	69.2 (13.1)	66.3 (15.9)	65.3 (7.8)
	3-Mental Worry Time	66.4 (21.4)	64.5 (21.4)	64.5 (20.0)
	4-Control	77.8 (17.1)	67.5 10.62)	69.0 (11.8)
SCL-90 GSI	1-Written Worry Time	1.1 (.52)	0.93 (.45)	0.89 (.42)
	2-Written Schedule	1.5 (.54)	1.2 (.51)	1.1 (.59)
	3-Mental Worry Time	1.4 (.80)	1.2 (.70)	1.0 (.76)
	4-Control	1.5 (.63)	1.3 (.56)	1.1 (.51)

Note: PSWQ = Penn State Worry Questionnaire, WDQ = Worry Domains Questionnaire, SCL-90 GSI = Symptom Checklist-90 General Symptoms Index.

Discussion

Contrary to hypothesis, the present study failed to find significant improvement beyond controls of a 15 min per day times 14 days, written or mental worry time intervention for a community sample of worriers. All groups, including a writing control and assessment only control, showed minor improvements over time with no differences between the groups.

Our findings differ from Borkovec, Wilkinson, et al.'s (1983) results whereby written and mental worry time were more effective than no intervention on self-reported percentage of time worrying. Rather, at a two-week follow-up, we found that individuals assigned to written and mental worry time, as well as writing schedules and completing assessments, experienced minor improvements in worry and general symptoms

of psychopathology. We used a community sample of self-identified worriers and the PSWQ, a standardized and validated measure of trait worry, whereas Borkovec, Wilkinson, et al. (1983) used an undergraduate sample of self-professed worriers and self-reported percentage of time worrying as measured by their Daily Worry Questionnaire (DWQ). Given the lack of psychometric data on the DWQ, it is unclear how it relates to the PSWQ and the DWQ was not used in the present study. The duration of worry time was also different. We asked participants to worry for 15 min per day across 14 days, whereas, Borkovec, Wilkinson, et al. (1983) asked participants to worry for 30 min per day across 30 days.

Unpublished investigations of short-term (e.g., 20- 30 min across 4- 5 days) worry time interventions using the PSWQ with undergraduate worriers found decreases across time and no differences between worry time and control conditions (Cogar et al., 2001; Haley, 1997). Despite the use of different dependent variables and our employment of a community versus undergraduate sample, the findings of the present study in conjunction with previous research (i.e., Borkovec, Wilkinson, et al., 1983) suggest daily duration (30 over 15 - 20 min) and/or frequency of "worry time" (28 days over 4 - 14 days) may be meaningful keys to decreasing problematic worry. It is also notable that despite statistically significant improvement across time, none of our groups fell below the GAD clinical cut-off at posttest or follow-up, again suggesting the intervention was too brief or lacked sufficient intensity.

Our finding that writing worries did not decrease worrying compared to control conditions is inconsistent with literature espousing the power of short- term writing (Smyth, 1998), and the finding that 10 min of writing about traumatic experiences across 3 - 5 days resulted in positive physical health effects (Pennebaker & Beall, 1986). It is likely that repeated writing allows both a catharsis of emotions as well as restructuring of cognition for past experiences. However, the therapeutic effect may not apply as rapidly to worry as to trauma because worry is future oriented and inherently involves negative affect and uncontrollable thoughts and images (Borkovec et al., 1983).

Both interesting and unexpected were the minor improvements experienced by the control groups. Participants in the writing control condition wrote their daily schedules. Time management is sometimes a part of cognitive-behavioral treatment for GAD (Brown, O'Leary, & Barlow, 2001) leaving the possibility that the written control condition served as a somewhat meaningful therapeutic condition. Perhaps a more appropriate written control condition would involve writing a more trivial topic such as describing one's living environment. In addition, participants could have expected to experience improvement by volunteering for a treatment study (Harrington, 1997), they could have been in an action stage of change (Prochaska, DiClemente, & Norcross, 1992), and/or they could have reported improvement to meet perceived experimenters' expectations. Unlike Borkovec, Wilkinson, et al. (1983), we did not include a counter-demand condition to control for demand characteristics, so we are unable to tease apart these possible influences.

There are several notable weaknesses of our study. First, although community participants volunteered for a treatment study and fit into a clinical range for worry on the PSWQ, we did not conduct diagnostic interviews. Likewise, our sample consisted of all Caucasian participants who were primarily female (90%), thereby limiting generalizability. Future research will need to further explore gender effects, especially given that women tend to ruminate more than men (Nolen-Hoeksema, Morrow, & Fredrickson, 1993). In addition, the use of diagnostic instruments to assess other symptoms of GAD besides worry, and the use of manipulation check measures to assess adherence to intervention instructions is recommended in future research targeting pathological worry.

While relatively small, our sample size per group was close to that employed by Borkovec, Wilkinson, et al.'s (1983) of $n = 18$ and examination of effect sizes suggests that an increase in participants would not have produced significant condition by time interactions. Although nonsignificant, examination of the pattern on the PSWQ in the mental worry group initially increased and failed to return to baseline at the two-week follow-up. Although this is possibly a spurious pattern, as Borkovec, Wilkinson, et al. (1983)

found a decrease in percentage of time worrying with a lengthier mental worry time intervention, future research should carefully compare potential differences in individual responses to mental versus written worry time. It is possible that mental worry time creates rumination especially with the use of brief mental worry time. In both naturalistic and laboratory studies, Nolen-Hoeksema and colleagues found that a ruminative response, as opposed to a distractive response, prolongs or worsens a depressed mood (Morrow & Hoeksema, 1990; Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema et al., 1993) and Blagden and Craske (1996) found that rumination stabilizes anxious moods, whereas distraction lessens anxious moods. Future research comparing mental versus written worry time may wish to better assess the transition of worry from the worry time interval to the pattern of daily worry to enhance our understanding of potentially therapeutic versus harmful interventions targeting worry.

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